Rectal prolapse: enlightenment of the obscure
Wijffels, N.A.T.
Colonic slow transit does not adversely influence the outcome of laparoscopic ventral rectopexy for obstructed defaecation

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Submitted
Abstract

**Objective:** Slow colonic transit co-exists with outlet obstruction but it is unclear whether its presence adversely influences the results of outlet obstruction surgery. We aimed to compare the functional results of laparoscopic ventral rectopexy for obstructed defaecation secondary to high-grade internal rectal prolapse in those with normal and slow colonic transit.

**Method:** Patients were evaluated with defecating proctography and colonic transit study. Those with high-grade internal rectal prolapse and significant symptoms not responding to conservative management including biofeedback were offered surgery. Bowel function was prospectively assessed pre-op and 12 months post-op using Wexner constipation score and Faecal Incontinence Severity Index (FISI).

**Results:** 63 patients underwent laparoscopic ventral rectopexy, 42 with normal and 21 slow colonic transit (mean colonic transit time 21.1 versus 87.3 hours, respectively, p<0.0001). Preoperatively, there was no significant difference between the two groups in age, sex, presentation, Wexner constipation score (mean 13.4 versus 13.8, respectively, p=0.72) or FISI score (mean 22.2 versus 25.9, p=0.46). The Wexner constipation score was significantly reduced in both groups at 12 months (p<0.0001). There was a significant reduction in FISI score at 12 months in the slow transit (p=0.002) but not the normal transit group (p=0.056). At 12 months post-op there was no significant difference between the two groups in Wexner constipation score (mean 8.5 versus 10.7, p=0.14) or FISI score (mean 15.3 versus 16.5, p=0.82).

**Conclusion:** Slow colonic transit has no adverse impact on the functional outcome of laparoscopic ventral rectopexy for obstructed defaecation due to high-grade internal rectal prolapse.
Introduction

Traditionally surgical patients with chronic constipation have been placed in one of three groups: those with slow transit constipation, outlet obstruction or mixed slow transit/outlet obstruction\(^1\), as determined by defaecating proctography and colonic transit studies.

Subtotal colectomy is now only occasionally offered to patients with severe intractable symptoms from slow transit constipation. Longer-term results have been variable\(^2\) with significant short and long term complications\(^3^4\). The results of colectomy have been particularly unsatisfactory in the presence of mixed slow transit/outlet obstruction, with persistent evacuatory difficulties in patients\(^5^6\). Most surgeons now avoid colectomy for slow transit constipation, and current therapy is largely medical with laxatives and enemas.

At the same time, surgery for outlet obstruction is currently undergoing a renaissance. The pathological significance of internal rectal prolapse has been re-appraised\(^7\), and the results of autonomic nerve-sparing laparoscopic ventral rectopexy and stapled transanal resection of the rectum (STARR procedure) have shown considerable improvement in functional and safety outcomes compared to historical controls of open posterior rectopexy\(^8^11\).

It is not known what influence the presence of additional slow colonic transit has on the outcomes of outlet obstruction surgery for internal rectal prolapse. The aim of this study was to compare the functional outcomes of laparoscopic ventral rectopexy for high-grade internal rectal prolapse in those with both normal and slow colonic transit.

Method

Since January 2005 all patients referred to a tertiary level pelvic floor clinic have had details entered into a prospectively maintained database (Filemaker Pro, Filemaker Pro Inc, Santa Clara, CA). All patients with a history and examination consistent with outlet obstruction constipation are assessed with defaecating proctography, anorectal physiology, manometry and transit studies. All patients were assessed with symptom scores (Wexner constipation score and Faecal Incontinence Severity Index) at baseline and at 12 months.
Transit studies were performed using the French radio-opaque marker single x-ray technique of Danquechin Dorval\textsuperscript{12} which allows calculation of actual colonic transit time by a mathematic formula. Ingestion of 10 radio-opaque markers was undertaken daily for 6 days and a single abdomen-pelvic x-ray was performed on day 7. Transit time was calculated by multiplying the number of markers remaining in the colon by 2.4. A transit time of greater than 50.4 hours was considered abnormal.

Proctography was performed according to a standardised protocol. A 310ml mixture of 100ml barium sulphate paste (Baritop, Barium Sulphate 94.6\% w/w, Sano-chemia Ltd, Bristol, UK) and 10ml of contrast (Gastrograffin, Scherring Healthcare Ltd, UK) were ingested orally 30 minutes prior to the procedure to opacify the small bowel. Immediately prior to the procedure with the patient in the left lateral position 100ml of barium paste (Barium Sulphate cream, 60\% w/w, E-Z-EM, Canada) was injected per anum into the rectum using a 50ml bladder syringe. The patient was then seated on a Perspex commode. Lateral X-rays were taken with a Siemens Sireskop SD image intensifier (Siemens AG, Forchheim, Germany) at 3 pulses/second, with the patient at rest, during squeeze and during evacuation for 30 seconds. Proctograms were performed and reported by a radiologist and colorectal surgeon with an interest in pelvic floor imaging. Prolapse grade was recorded using the Oxford Rectal Prolapse Grading system\textsuperscript{13} (figure 2, table 1, page 12,13).

Our unit policy on outlet obstruction was as follows: from August 2005, patients with high-grade (Oxford grade 3 and 4) internal rectal prolapse, significant outlet obstruction symptoms resistant to conservative measures and normal colonic transit were offered laparoscopy ventral rectopexy. From 2007, the presence of slow colonic transit was no longer regarded as an absolute contraindication to outlet obstruction surgery. With the pressure of increasing referrals from gastroenterology of patients with outlet obstruction and slow colonic transit, this contraindication was relaxed. It was anticipated that improvement in the outlet obstruction component of the mixed problem might allow better medical management of the slow transit. The expectation was that functional outcomes would be inferior to those with normal colonic transit, and patients were carefully counseled accordingly. Prospective data were kept on functional outcomes in these patients and this paper reports these results.

Analysis was performed using Microsoft Excel and Graphpad. Data was tested for normality using a Kolmogorov-Smirnov test. Statistical analysis was performed using unpaired t-test with Welch correction for parametric data and Mann-Whitney U test for non-parametric data. Statistical significance was defined as a p value of <0.05.
Results

Demographics
A total of 63 patients were identified, 42 with normal colonic transit and 21 with delayed colonic transit. 95% were female and 5% were male and the mean age was 55.2 years (range 20 to 84 years). There was no significant difference in the 2 patient groups in terms of age, sex, presenting complaint (table 1). By definition, colonic transit time was longer in the slow transit group.

<table>
<thead>
<tr>
<th></th>
<th>Slow transit</th>
<th>Normal transit</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>21</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Mean colonic transit time (hrs)</td>
<td>87.3</td>
<td>21.1</td>
<td>P&lt;0.0001</td>
</tr>
<tr>
<td>Mean age (yrs)</td>
<td>56.6</td>
<td>54.9</td>
<td></td>
</tr>
<tr>
<td>% females</td>
<td>100</td>
<td>93</td>
<td></td>
</tr>
<tr>
<td>Presentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OD</td>
<td>7 (33%)</td>
<td>15 (36%)</td>
<td></td>
</tr>
<tr>
<td>Mixed OD/FI</td>
<td>12 (57%)</td>
<td>23 (55%)</td>
<td></td>
</tr>
<tr>
<td>FI</td>
<td>1 (5%)</td>
<td>1 (2%)</td>
<td></td>
</tr>
<tr>
<td>Pain/ prolapse</td>
<td>1 (5%)</td>
<td>2 (5%)</td>
<td></td>
</tr>
</tbody>
</table>

Table 1, Demographics.
OD= obstructed defaecation, FI= faecal incontinence.

Outlet obstruction with normal transit group
Pre versus post-op constipation score
The mean pre-op Wexner constipation score was 13.4 (standard error 0.74, range 0 to 22). The mean 12 month Wexner constipation score was 8.5 (s.e. 0.68; 1 to 20). The mean change in Wexner constipation score was -4.9 (s.e. 5.1; -6 to 16). There was a significant reduction in Wexner constipation score between pre-op and 12 months post-op (p<0.0001).

Pre versus post-op faecal incontinence score
The mean pre-op FISI was 22.2 (2.7; range 0 to 61). The mean 12 month FISI score was 15.3 (2.1; 0 to 43). The mean change in FISI score was -7.0 (2.4; -23 to 43). There was a reduction in FISI score between pre-op and 12 months post-op (p=0.056).

Outlet obstruction with slow transit group
Pre versus post-op constipation score
The mean pre-op Wexner constipation score was 13.7 (0.76; 4 to 19). The mean 12 month Wexner constipation score was 10.7 (1.2; 2 to 19). The mean change in Wexner constipation score was -3.1, (0.6; -4 to 14). There was a significant reduction in Wexner constipation score between pre-op and 12 months post-op (p<0.0001).

Pre versus post-op faecal incontinence score
The mean pre-op FISI was 25.9, (4.0; 0 to 53). The mean 12 month FISI was 16.5 (4.1; 0 to 61). The mean change in FISI score was -9.4, (1.8, -33 to 15). There was a significant reduction in FISI score between pre-op and 12 months post-op (p=0.002).
Normal versus slow transit

Comparison of pre-op Wexner constipation scores (p=0.72) and 12 months post-op constipation scores (p=0.14) between those with normal transit or slow transit did not reveal any significant difference (table 2). Comparison of baseline FISI (p=0.46) and 12 month FISI (p=0.82) between the two groups also revealed no significant difference.

<table>
<thead>
<tr>
<th></th>
<th>Slow transit</th>
<th>Normal transit</th>
<th>p value (normal v slow)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number</strong></td>
<td>21</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td><strong>Wexner score (mean)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-op</td>
<td>13.8</td>
<td>13.4</td>
<td>0.72</td>
</tr>
<tr>
<td>12 months post-op</td>
<td>10.7</td>
<td>8.5</td>
<td>0.14</td>
</tr>
<tr>
<td>Reduction (%)</td>
<td>3.1 (22%)</td>
<td>4.9 (37%)</td>
<td></td>
</tr>
<tr>
<td>p value (pre vs. post-op)</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td><strong>FISI score (mean)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-op</td>
<td>25.9</td>
<td>22.2</td>
<td>0.46</td>
</tr>
<tr>
<td>12 months post-op</td>
<td>16.5</td>
<td>15.3</td>
<td>0.82</td>
</tr>
<tr>
<td>Reduction (%)</td>
<td>9.4 (36%)</td>
<td>6.9 (31%)</td>
<td></td>
</tr>
<tr>
<td>p value (pre vs. post-op)</td>
<td>0.002</td>
<td>0.056</td>
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</table>

Table 2, Functional results.

Discussion

This study has shown that there is no significant difference in the one year outcomes of patients undergoing laparoscopic ventral rectopexy between those with high-grade internal rectal prolapse associated with slow transit constipation, and those associated with normal colonic transit. Thus patients with outlet obstruction, internal prolapse and significant symptom burden, who have failed a course of conservative management, can be considered for surgery regardless of transit time.

Rome III\(^4\) provides a modern definition for functional constipation but it does not distinguish between slow transit constipation and outlet obstruction. In practice it has been accepted that those with a feeling of incomplete evacuation, straining, tenesmus, and assistance of evacuation, rather than stool infrequency, are more likely to have outlet obstruction\(^1\), but symptoms have limited predictive ability\(^7\). Physical examination can often identify internal rectal prolapse and those requiring proctography\(^15\).

The diagnosis of slow transit constipation requires demonstration of delayed colonic transit on radio-opaque marker or nuclear studies. Slow transit constipation often coexists with outlet obstruction in a mixed figure. Interestingly the segmental pattern of slow transit within the colon has not been shown to be predictive of the presence or absence of obstructed defaecation\(^16\).
There is very little published on the treatment of patients with mixed slow transit/outlet obstruction constipation therefore the optimal treatment of these patients is unknown. Biofeedback has been shown to be beneficial for both obstructed defaecation and slow transit constipation, and since many units have adopted an almost exclusively conservative approach to chronic constipation using laxatives and biofeedback, this has become a common approach for patients with a mixed slow transit/outlet obstruction constipation.17

In those with a more traditional surgical approach to slow transit constipation, biofeedback has been used to treat the outlet obstruction, after which subtotal colectomy is deployed for the treat the slow transit component.18 However, this approach has yielded mixed results especially in the resolution of outlet obstruction symptoms, many of which historically have been poorly elicited and investigated.5 The long term failure rate, significant mortality, morbidity and stoma rate has led to many anyway to abandon subtotal colectomy as tool for chronic constipation.19

The evolution of outlet obstruction surgery for internal rectal prolapse has now been well charted, with both laparoscopic ventral rectopexy and STARR procedure now offering safe and effective methods of treatment in patients who have failed conservative measures.20 The twin dogmas of the 1980’s and 90’s that internal rectal prolapse is an incidental variant of normal21 and that surgery is not recommended due to poor functional outcomes22 has been overturned by new published radiological23,24 and surgical evidence.5,11 As a result, colorectal surgeons are increasingly confident and well-supported in number offering suitable patients surgical treatment for internal rectal prolapse causing obstructed defaecation.

Early reports of laparoscopic ventral rectopexy for obstructed defaecation either ignore9 colonic transit or cautiously exclude8 patients with abnormal transit studies. The present study rather surprisingly and contrary to our suspicions, shows that patients with outlet obstruction from high-grade internal rectal prolapse can be offered laparoscopic ventral rectopexy in the presence of associated slow transit constipation, and can expect similar functional outcomes to those with pure outlet obstruction.

Why might outcomes be similar between those with normal and slow transit? It has been shown that constipated patients have altered colonic motility and response to cholinergic stimulation but maintain colonic response on waking,25-27 suggesting changes in local nervous stimulation. However it has not been shown whether these abnormalities are due to a primary pan colonic dysmotility problem, or are secondary to outlet obstruction. It has also been shown that colonic transit time can vary widely with time.28 It is also possible that prolonged colonic transit time may occur secondary to and be improved by treatment of outlet obstruction. Our data also support the idea that delayed colonic transit is not particularly clinically significant, and that good functional improvements can be obtained despite disregarding it, though it is unclear what further
benefit may be achievable by subtotal colectomy after correction of outlet obstruction in such patients. Caution must therefore be exercised in assessing the power of transit studies to diagnose a colonic motility problem in those with obstructed defaecation. It is perhaps over-simplistic to consider outlet obstruction and slow transit as distinct clinical entities.

There are limitations to this study. The first relates to the selection of patients in this study as they are patients derived from a tertiary referral clinic and they may not be representative of constipated patients as a whole. Furthermore, many patients coming to our clinic with outlet obstruction and/or slow transit constipation are not offered surgery. This was most commonly because they reported a good response to conservative measures. Secondly, we did not impose restrictions on laxative use after (nor indeed before) surgery and some of the benefit may have derived from this. However, patients were encouraged to maximise any potential pharmacological benefit prior to surgery. Thirdly, patient numbers are relatively small. Whilst Wexner scores improve significantly in both normal and slow transit groups, the improvement is less marked in the slow transit group, though this does not attain statistical significance. Finally, we have not documented post operative transit times, preferring to accept symptomatic improvement as the more important post-operative parameter.

We conclude that slow colonic transit has no adverse impact on the functional outcome of laparoscopic ventral rectopexy for obstructed defaecation due to high-grade internal rectal prolapse.
References


